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ABSTRACT:

Cutting apparatus includes an elongate frame (10) having two parallel guides (12). A carriage (16) is carried between and tracks said guides (12). A power saw (26) is mounted on said carriage (16) with two disc blades fitted thereto to extend through a slot provided in said carriage (16). Means is provided to secure said frame (10) to a surface in which a 16 channel is to be formed.

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(58) Field of search

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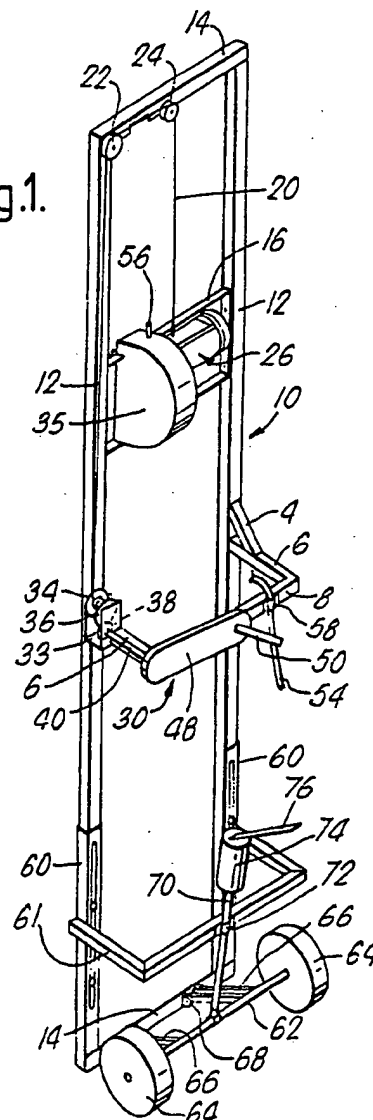
Selected US specifications from IPC sub-class

B28D

(54) Apparatus for cutting channels in walls

(57) Cutting apparatus includes an elongate frame (10) having two parallel guides (12). A carriage (16) is carried between and tracks said guides (12). A power saw (26) is mounted on said carriage (16) with two disc blades fitted thereto to extend through a slot provided in said carriage (16). Means is provided to secure said frame (10) to a surface in which a channel is to be formed.

Fig.1.



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Fig.1.

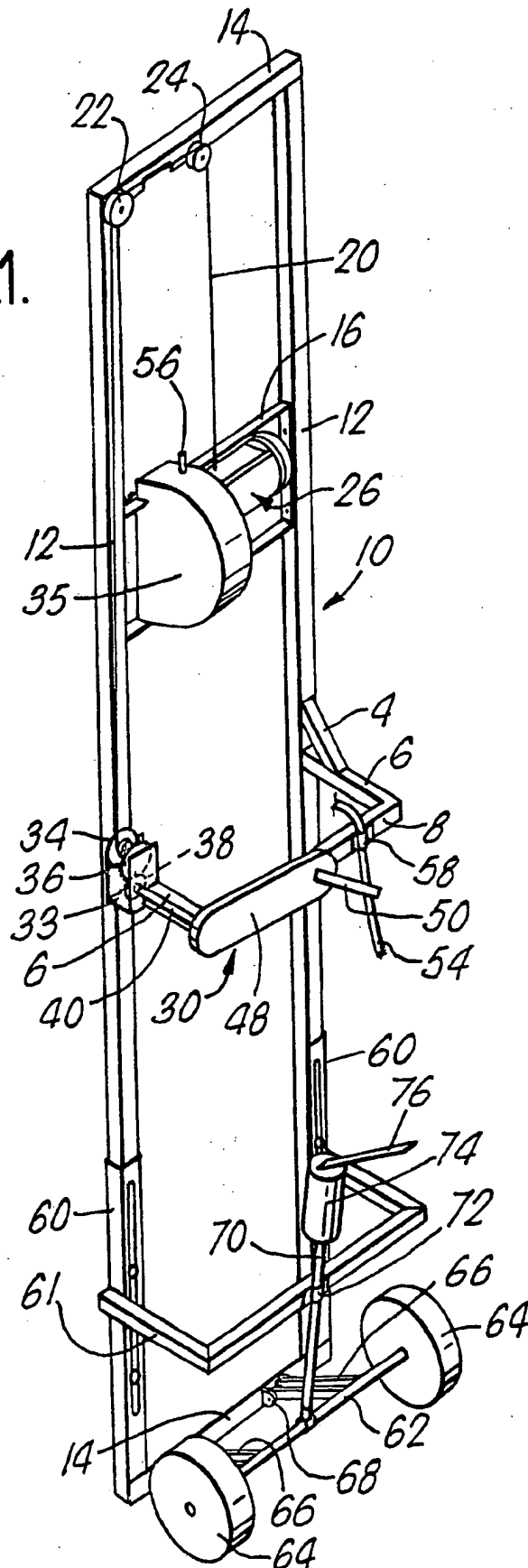


Fig. 2.

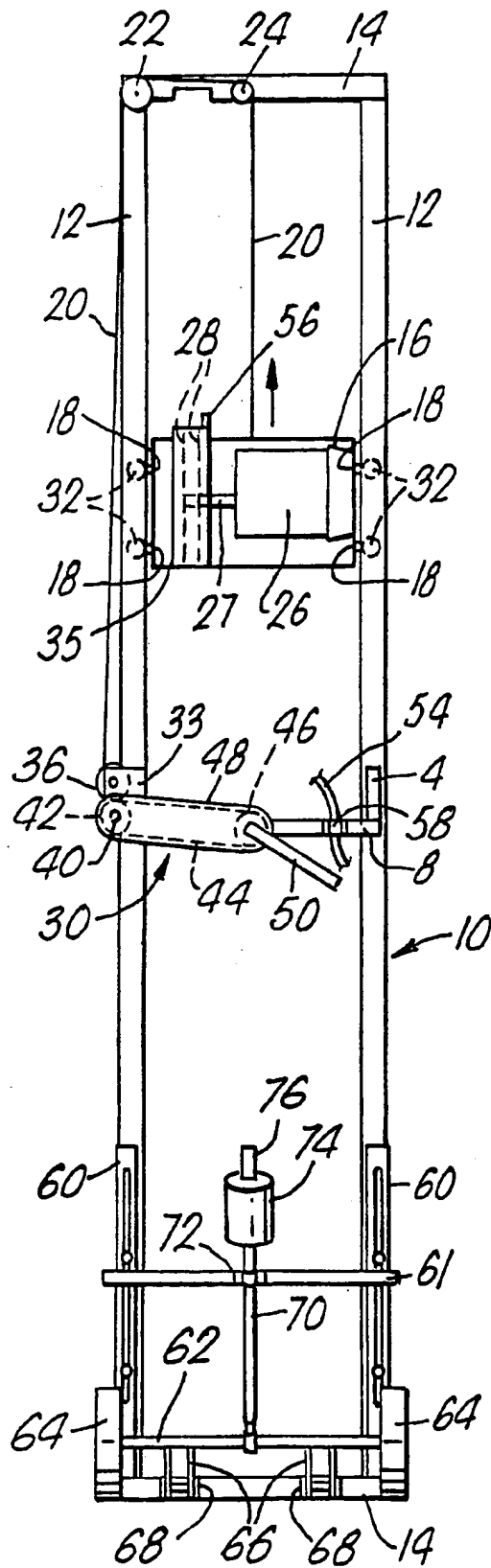
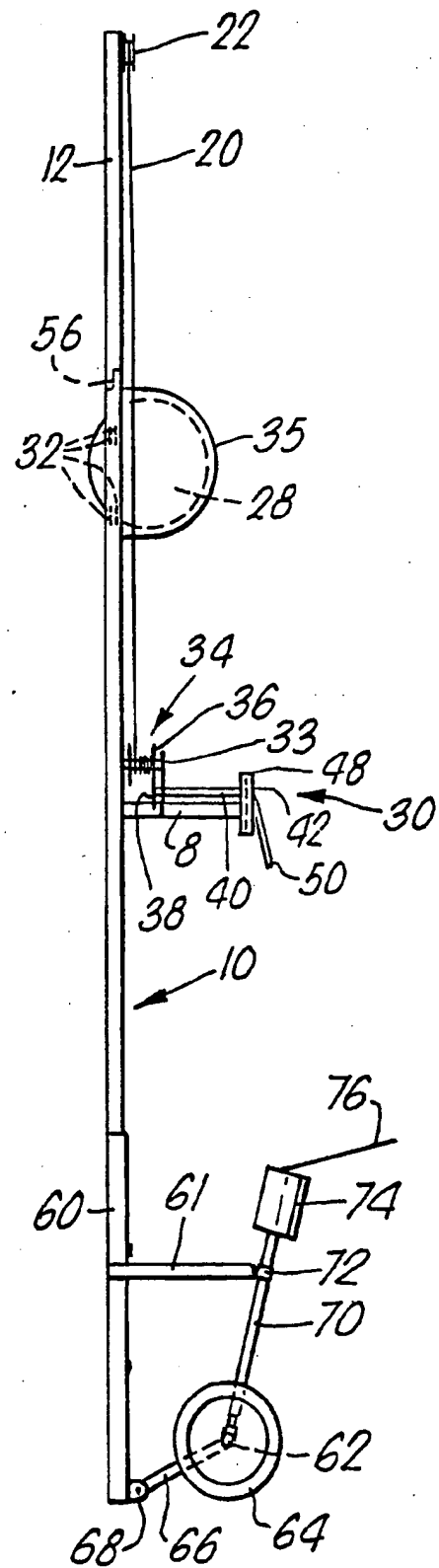


Fig. 3.



CUTTING APPARATUS

This invention relates to cutting apparatus for use in cutting tracks in cementitious material, for example a wall formed from building blocks of concrete or cement bound breeze or pumice particles or other
05 suitable filler material. The tracks are for use in accommodating conduits for electrical or other wiring or other piped or conduited utilities intended to be hidden behind the plastered finished surface of a wall or below the finish screed on a floor.

10 Heretofore such tracks have been formed by using a power saw with a single disc blade to cut two single grooves side-by-side and then chipping out the land therebetween. This operation suffers from the disadvantages that only carborundum disc blades can be
15 used, since unless the operator has a steady hand and a good eye for and can cut in a straight line, the more expensive diamond tipped disc blades will snap. The carborundum disc blades when used in cutting cementitious material wear very quickly and it is
20 possible that several will require to be used in making such grooves depending on the length required. Also, in cutting the two side-by-side grooves, it is normally not possible for an operator using a manually-held saw to be able to produce two parallel grooves. The further apart
25 the grooves are, the more difficult it is to remove the

land therebetween. Further, not only does the disc blade heat up and the cutting operation create a considerable amount of dust, but the time taken to produce such grooves and remove the land therebetween is very time-consuming.

It is an object of the present invention to provide cutting apparatus which obviates or mitigates the above disadvantages.

In accordance with the present invention, cutting apparatus includes an elongate frame having two parallel guides, a carriage carried between and tracking said guides, a power saw mounted on said carriage with a disc blade fitted thereto to extend through a slot provided in said carriage, and means to anchor said frame to a surface to be provided with a track.

Preferably, the frame has at least two cross-members to secure the guides in the parallel relationship, one of which cross-members being at or near to one end of the frame. A flexible element preferably connects the carriage to a winding mechanism, the element being entrained around a series of pulleys mounted on said frame. Two pulleys are preferably provided, one roller at the one end of the guides and one roller on the adjacent cross-member, the anchoring mounting of which pulley on said cross-member being in longitudinal alignment with the anchoring mounting of

the element to the carriage.

Preferably also, intermediate of the length of the guide on which the roller is mounted, a reel of the winding mechanism is mounted and around which the element is adapted to be wound onto and off. A handle is preferably provided to enable the reel to be rotated to wind the element onto and off so to cause the carriage to be moved longitudinally of said guides.

Preferably further, two disc blades are provided on the power shaft of the saw with the distance therebetween being adjustable to correspond with the required land width between the grooves to be made. Spray apparatus is preferably provided including one or more spray nozzles connected by piping to a water supply, the nozzle or nozzles being directed onto the cutting operation so as to dampen down and reduce the amount of dust created during the cutting operation.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

Fig. 1 is a perspective view of a cutting apparatus according to the present invention;

Fig. 2 is a front view; and

Fig. 3 is a side view.

Referring to the drawings, cutting apparatus for use in cutting tracks in cementitious material includes an elongate frame 10 having two parallel guides 12 of

C-shape with the open sides facing inwardly towards each other. In this embodiment, the frame 10 is intended for upright orientation for use of the cutting apparatus in cutting tracks in walls. The frame 10 has two cross-
05 members 14, one at or near to each of the ends of the two guides 12 to secure the guides 12 in the parallel relationship. An intermediate cross-member 8 is spaced from the guides 12 by side arms 6 as shown. One arm 6 is braced at 4 as shown to one of the guides 12. A
10 rectangular carriage 16 is carried between and tracks said guides 12. The carriage 16 has four similar brackets 18, one extending transversely from at or near to each corner thereof and carrying at its outer end two co-axial wheels 32 which run on rails provided inside
15 the guides 12. A slot is provided longitudinally of the carriage 16 parallel with the guides 12 and to one side of carriage 16 as shown. A flexible element 20, such as a wire rope, cord or cable, connects the upper transverse side of the carriage 16 to a winding
20 mechanism 30, the element 20 being entrained around a series of pulleys mounted on said frame 10. Two pulleys 22,24 are provided in the series, one roller 22 at the top end of one of the guides, ie. the left hand one as shown in Figs.1 and 2 of the drawings, and one roller 24
25 on and mid-way of the top cross-member 14, the anchoring mounting of which pulleys 24 on said cross-member being

in longitudinal alignment with the anchoring mounting of the element 20 to the carriage 16.

05 A power saw 26 is mounted on the outside face (relative to the work surface) of said carriage 16 with two co-axially mounted diamond-tipped disc blades 28 fitted to the output shaft 27 for their cutting portions to extend through the slot provided in said carriage 16 to project beyond said inside face. A guard 35 is provided to encase the portions of the blades 28 on the
10 outside face of the carriage 16.

Intermediate the length of the guide 12 on which the roller is mounted, a reel 34 of the winding mechanism 30 is mounted in a U-bracket 33 fitted around arm 6 as shown, the reel 34 being around which the
15 element 20 is adapted to be wound onto and off. The outer side 36 of the reel 34 is a toothed wheel meshing with a smaller cogged wheel 38 carried at the inner end of a spindle 40 journaled in one limb of the bracket 33. The spindle 40 mounts at its outer end a sprocket
20 wheel 42 around which a bicycle chain 44 is meshingly entrained. The chain 44 is also meshingly entrained around a second sprocket wheel 46 mounted for rotational movement on cross-member 8. A guard 48 secured to cross-member 8 encases the wheels 42,46 and
25 chain 44. A handle 50 is provided secured to wheel 46 to rotate through the gearing above-described the reel 34 to wind the element 20 onto and off so to cause the

carriage 16 to be moved longitudinally of said guides
12.

05 The distance between the two disc blades 28
provided on the power shaft of the saw 26 is adjustable
to correspond with the required land width between the
grooves to be made. Spray apparatus is provided
including one or more spray nozzles connected by piping
54 to a water supply, the nozzle or nozzles being
mounted at 56 on the carriage 16 to be directed onto the
10 cutting operation so as to dampen down and reduce the
amount of dust created during the cutting operation. An
ON/OFF valve 58 in piping 54 is provided on cross-member
8.

15 Means to anchor said frame 10 to a surface to be
provided with a track can comprise any suitable
conventional mechanisms, devices or fastenings. The
preferable means as used in this embodiment and shown in
the drawings comprises an extension 60 being provided to
the bottom of each guide 12, the extensions 60 being
20 united with the lower cross-member 14 extending
therebetween. The extensions 60 are for length-adjusting
the guides 12.

25 A U-bracket 61, similar to cross-member 8 and side
arms 6, is connected between extensions 60 as shown. An
axle 62 carrying two wheels 64 is connected by two pairs
of links 66 to pivotal mountings 68 provided on the

lower cross-member 14. A piston and cylinder arrangement 70 is provided to extend downwardly with the distal end of the piston connected to axle 62 and the cylinder anchored by bracket 72 to bracket 62. The outer end of the cylinder mounts an oil reservoir 74 operated by a hand lever 76.

In use, the apparatus is located against a wall in which a track is to be cut. The hand lever 76 is pumped up and down to extend the piston and cause the axle 62 to move downwardly till the wheels 64 abut the ground with the top cross-member 14 abutting the ceiling joists. The frame 10 is then jammed into position. The saw 26 is connected to a source of electricity and piping is connected to a water supply. The spacing between the two blades 28 is adjusted, if required, and the saw 26 switched on. The carriage 16 is positioned at its uppermost position between the guides 12. The blades 28, although initially spacing the frame 10 from the wall, cut into the wall forming two grooves therein. By rotating the handle 50, the carriage 16 and saw 26 can be progressed down the wall forming the grooves as it moves down. With the spray apparatus switched 'ON', water will be sprayed as the blades 28 are cutting into the wall, thereby dampening the dust created and also dissipating the heat created in the blades 28. After the grooves are cut, the frame 10 is removed by the hand lever 76 being moved to release the air pressure on the

oil allowing it to flow back into the reservoir and retract the piston. The land between the grooves is then chipped out to form the track. The controlled movement of the saw 26 during cutting operations means that
05 diamond tipped disc blades 28 can be used with the known benefits to be derived from such use. In a simplified modification of the invention, only one disc blade can be used if only one groove is required, or in the event of a blade being available giving a groove equivalent to
10 the width of track required.

Variations and modifications can be made to the invention exemplified above without departing from the scope of the invention.

CLAIMS:

- 05 1. Cutting apparatus includes an elongate frame having two parallel guides, a carriage carried between and tracking said guides, a power saw mounted on said carriage with a disc blade fitted thereto to extend through a slot provided in said carriage, and means to secure said frame to a surface to be provided with a track.
2. Cutting apparatus as claimed in Claim 1, wherein the frame has at least two cross-members to secure the guides in the parallel relationship, one of which cross-members being at or near to one end of the frame.
3. Cutting apparatus as claimed in Claim 1 or 2, wherein a flexible element connects the carriage to a winding mechanism, the element being entrained around a series of pulleys mounted on said frame.
4. Cutting apparatus as claimed in Claim 3, wherein two pulleys are provided, one roller at the one end of the guides and one roller on the adjacent cross-member.
5. Cutting apparatus as claimed in Claim 4, wherein the anchoring mounting of the pulley on said cross-member is in longitudinal alignment with the anchoring mounting of the element to the carriage.

6. Cutting apparatus as claimed in any one of Claims 3,4 or 5, wherein intermediate of the length of the guide on which the roller is mounted, a reel of the winding mechanism is mounted and around which the element is adapted to be wound onto and off.

7. Cutting apparatus as claimed in Claim 6, wherein a handle is provided to enable the reel to be rotated to wind the element onto and off so to cause the carriage to be moved longitudinally of said guides.

8. Cutting apparatus as claimed in any one of the preceding Claims, wherein two disc blades are provided on the power shaft of the saw.

9. Cutting apparatus as claimed in Claim 8, wherein the distance between the two blades is adjustable.

10. Cutting apparatus as claimed in any one of the preceding Claims, wherein spray apparatus is provided including one or more spray nozzles connected by piping to a water supply, the nozzle or nozzles being directed onto the cutting operation.

05

11. Cutting apparatus as claimed in any one of the preceding Claims, wherein the frame securing means comprises a wheeled assembly mounted at the end of the frame remote from the pulleys and actuable to be extended to jam a frame against ceiling joists to secure the frame against a wall.

05

12. Cutting apparatus substantially as hereinbefore described with reference to the accompanying drawings.